

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 01/16/2001

Experimenters: Jason Marshall, John Brunelle

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Fluxes, Greases, Lubricating/Lapping Oils, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To compare cleaning efficiency of similar products from two manufactures

Experimental Procedure: Two products were diluted to five percent using DI water in 600 ml beakers. The solutions were heated to 130 F on a hot plate. Preweighed coupons were contaminated with the various contaminants and weighed again. Next, three coupons with the same contaminant were immersed into a beaker agitated with a magnetic stir bar. Cleaning lasted for five minutes. The coupons were rinsed using tap water at 120 F for 30 seconds and dried for 2 hours at room temperature. Once the coupons were dry, final clean weights were recorded and the efficiency of the cleaning products were determined.

SUBSTRATE MATERIAL:

Table 1. Substrates Cleaned

Substrate Code ID#

Aluminum AL1 5086 H-32

AL2 1100 H-14

Table 2. Contaminants Removed

Contaminant CAS#

Flux FX, Kester 1544 Rosin 64-17-5, 78-92-2, 8050-09-7

Grease GR, KSL-111 64742-57-0, 64742-62-7, 8052-42-4

Lubricant LU, 423 64742-47-8

Oil OI, Hydraulic, East Falls Co. 64742-65-0

Results: Both cleaners had difficulty in removing the lubricant from the aluminum coupons with Emkay removing just over 60% of the lubricant and Magnum only removing just under 50%. Magnum was more successful in cleaning the other three contaminants as shown in the side by side comparison in Table 4.

Table 4. Direct Comparison

| Contaminant | Emkay | Magnum |
|-------------|-------|--------|
| flux | 58.33 | 99.55 |
| grease | 78.7 | 97.19 |
| lubricant | 60.43 | 49.82 |
| oil | 87.77 | 94.13 |

The results for each cleaner are listed in Table 5.

Table 5. Product Efficiencies

| RAW DATA | | | | | | | | | |
|----------------|-------------------|------------|------------|------------|---------------|-------------------|------------|------------|------------|
| Company | Emkay | | | | Company | Magnum Research | | | |
| Product | Safety Wash Clear | | | | Product | Aluminum Aerowash | | | |
| Classif. | Alk-aq | | | | Classif. | Alk-aq | | | |
| Subst/ Cont | AL1- FX | AL1- GR | AL2- LU | AL2- OI | Subst/ Con | AL1- FX | AL1- GR | AL2- LU | AL2- OI |
| Coupon 1 | 78.13 | 52.27 | 56.28 | 97.40 | Coupon 1 | 99.14 | 97.98 | 42.75 | 98.39 |
| Coupon 2 | 51.21 | 91.17 | 62.63 | 78.15 | Coupon 2 | 99.10 | 96.91 | 51.76 | 97.51 |
| Coupon 3 | 45.65 | 92.64 | 62.35 | 87.76 | Coupon 3 | 100.4 | 96.66 | 54.96 | 86.46 |
| Average | 58.33 | 78.69 | 60.42 | 87.77 | Average | 99.55 | 97.19 | 49.82 | 94.12 |

Summary:

| | | | | | | |
|----------------------|--|---------------|--------------------|-------------------|----------------------|--|
| Substrates: | Aluminum | | | | | |
| Contaminants: | Cutting/Tapping Fluids, Fluxes, Greases, Lubricating/Lapping Oils, Oil | | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |

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|-----------------------------|-------------------|---|-------|-------------------------------------|-----------|
| Emkay Chemical Company | Safety Wash Clear | 5 | 58.33 | <input type="checkbox"/> | flux |
| Emkay Chemical Company | Safety Wash Clear | 5 | 78.70 | <input type="checkbox"/> | grease |
| Emkay Chemical Company | Safety Wash Clear | 5 | 60.43 | <input type="checkbox"/> | lubricant |
| Emkay Chemical Company | Safety Wash Clear | 5 | 87.77 | <input checked="" type="checkbox"/> | oil |
| Magnum Research Corporation | Aluminum Aerowash | 5 | 99.55 | <input checked="" type="checkbox"/> | flux |
| Magnum Research Corporation | Aluminum Aerowash | 5 | 97.19 | <input checked="" type="checkbox"/> | grease |
| Magnum Research Corporation | Aluminum Aerowash | 5 | 49.82 | <input type="checkbox"/> | lubricant |
| Magnum Research Corporation | Aluminum Aerowash | 5 | 94.13 | <input checked="" type="checkbox"/> | oil |

Conclusion:

Magnum Research Aluminum Aerowash removed over 94% of the contaminants for three of four contaminants. Emkay Chemical Safety Wash Clear was successful in removing over 85% of the contaminants in one of four evaluations.